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## **CLAIMS**

What is claimed is:

•	1. It digital ODIVIT wholess communication system comprising.	
2	a plurality of transmitters, one or more of said transmitters compris	ing a b
3	station baseband processor, a finite impulse response (FIR) filter, a pre-dis	tortion

A digital CDMA wireless communication system comprising:

phase equalizer and a digital-to-analog (DAC) converter;

a plurality of receivers, one or more of said receivers comprising an analog to digital (ADC) converter, a FIR filter, a phase equalizer and a receiver baseband processor; and

said receiver FIR filter being matched to said transmitter FIR filter and said receiver phase equalizer is matched to said pre-distortion phase equalizer.

- 2. A wireless CDMA communication system as in claim 1 wherein said transmitter FIR filter and said receiver FIR filter are constrained such that  $|H_{tx}(z)H_{rx}(z)|$  has linear phase and odd symmetry about half the inter-chip frequency  $(f_c/2)$ .
- 3. A digital CDMA wireless communication system as in claim 1 wherein the transmitter predistortion phase equalizer and said receiver phase equalizer are constrained to  $H_{\text{txeq}}(z)=H_{\text{txeq}}(z^{-1})$  in the z domain.
- 4. A digital CDMA wireless communication system as in claim 3 wherein each of the predistortion phase equalizer and the receiver phase equalizer has a transfer

3 function of 
$$H_{eq}(z) = \frac{b_0 + b_1 z^{-1} + b_2 z^{-2}}{a_0 + a_1 z^{-1} + a_2 z^{-2}}$$

- 4 where  $a_0 = b_2$ ,  $a_1 = b_1$ , and  $a_2 = b_0$ .
- 5. A wireless CDMA communication system as in claim 4 wherein said transmitter FIR filter and said receiver FIR filter are constrained such that

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- $|H_{tx}(z)H_{rx}(z)|$  has linear phase and odd symmetry about half the inter-chip frequency (f<sub>c</sub>/2).
- 6. A digital CDMA wireless communication system as in claim 5 wherein the circuit response (H(z)) for the path from said base station baseband processor in said one or more transmitter to said receiver baseband processor has a linear phase and flat amplitude in-band such that (H(z)=H<sub>tx</sub>(z)H<sub>txeq</sub>(z)H<sub>txeq</sub>(z)H<sub>txeq</sub>(z)).
  - 7. A digital CDMA wireless communication system as in claim 1 wherein the circuit response (H(z)) for the path from said base station baseband processor in said one or more transmitter to said receiver baseband processor has a linear phase and flat amplitude in-band such that (H(z)= $H_{tx}(z)H_{txeq}(z)H_{rxeq}(z)H_{rxeq}(z)$ ).